Spatial ecology of the Common Nighthawk (*Chordeiles minor*) and insect prey abundance in the Halifax Backlands

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The Common Nighthawk (*Chordeiles minor*) is a migratory, ground-nesting bird that is federally listed as a Species at Risk in Canada. As aerial insectivores, global insect decline is hypothesized to be a leading threat to nighthawk populations. Nighthawks have been historically observed in the Halifax Backlands, an urban wilderness area southeast of Halifax, Nova Scotia. The Backlands feature a post-fire landscape with open rock faces, young jack pines and a diversity of low-growing shrubs including blueberry, huckleberry and crowberry bushes. This unique ecosystem, paired with numerous wetlands, makes the Halifax Backlands an ideal breeding and foraging ground for the Common Nighthawk. In the summer of 2024, Autonomous Recording Units (ARUs) were deployed at 21 sites to detect nighthawk presence across the Backlands. Visual surveys were conducted to count and map individuals, and to quantify their behaviours. Two types of insect traps were used concurrently with ARUs to estimate insect prey availability. Malaise intercept traps were used to passively capture aerial insects, while light traps were deployed to trap nocturnal aerial insects. Nighthawk abundance and spatiotemporal distribution was compared to insect abundance metrics to examine this predator-prey relationship. A Generalized Linear Mixed Model (GLMM) was used to relate nighthawk activity to insect abundance. Spatial distribution of nighthawks was estimated using Kriging interpolation. A Generalized Additive Model (GAM) was used to relate nighthawk detection rates to habitat metrics derived from LiDAR and GIS layers. Results of this study will identify the areas most important for conserving the nighthawk population of the Backlands.

Keywords: conservation biology, aerial insectivore, spatial ecology, insect abundance.